

ENVIRONMENTAL AESTHETICS AND PSYCHOLOGICAL WELLBEING: RELATIONSHIPS BETWEEN PREFERENCE JUDGEMENTS FOR URBAN LANDSCAPES AND OTHER RELEVANT AFFECTIVE RESPONSES

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In the general field of Environmental Psychology an increasing number of studies propose that subjects' general well-being can be significantly increased as a result of contact with environments considered to have high aesthetic value. The present study has attempted to study the possible effects of the contemplation of everyday landscapes on citizens' emotional well-being, identifying some of the main affective responses associated with aesthetic judgements of urban landscapes. Relevant data have been obtained by means of a photographic questionnaire administered individually to a representative sample of adolescents living in Seville, Spain. The results suggest that aesthetic appraisal responses play an important role from an affective point of view, given that these responses are closely associated with the most important variables that configure –according to various studies– the two fundamental dimensions (pleasure and arousal) of the global significance of physical environments.

En el ámbito general de los estudios de psicología ambiental, un creciente número de trabajos ha planteado que el bienestar general de los individuos puede verse incrementado significativamente por el contacto de los mismos con ambientes considerados de alto valor estético. En línea con lo anterior, en la presente investigación se ha perseguido estudiar los efectos que la contemplación de los paisajes cotidianos puede ejercer sobre el bienestar emocional de los ciudadanos, identificando algunas de las principales respuestas afectivas que se encuentran asociadas a los juicios estéticos por paisajes urbanos. La información requerida se ha recogido a través de un cuestionario fotográfico administrado de manera individualizada, por encuestadores preparados a tal efecto, a una muestra representativa de los adolescentes residentes en Sevilla capital. Los resultados obtenidos ubican a las respuestas de valoración estética en una situación de privilegio desde un punto de vista afectivo. Ello, porque dichas respuestas se encuentran estrechamente asociadas a las variables más importantes que configuran –según han delimitado diferentes estudios– las dos dimensiones fundamentales (placer y arousal) del significado global que los entornos físicos poseen para los individuos.

The progressive deterioration suffered by our physical environments has given rise, over the last thirty years, to a political-social sensitization, mainly in the developed world, focused on the need to increase and/or guarantee the protection of areas of great aesthetic value or natural beauty. Thus, and principally in the English-speaking countries, an important body of legislation has been developed aimed at identifying and managing the so-called *landscape resources* –that is, those landscapes or locations considered of great value (or quality) that should be protected, conserved or optimised.

This context, together with the scientific and academic

interest aroused, from the 1970s onwards, by the study of perception-appraisal processes in the real world context (Ittelson, 1973, 1978; Gibson, 1979; Zube, 1980, 1982), prepared the ground for the proliferation of studies assessing the aesthetic quality of landscapes. The three central concepts characterising these studies (aesthetics, landscape and quality) and the investigation of the relationships between them, has determined the character and significance of the research, which has been developed, basically, within the empirical context of natural landscapes. We consider *quality* to be a pivotal concept with regard to the perspective of the different studies.

The term *quality* has, in the research analysed, generally been considered as representing a continuum of perfection or dimension of excellence along which different landscapes can be situated. The question of who situates a landscape in a given position on the continuum, and by

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which criteria, has given rise to the formation of two broad lines or approaches in the evaluation of landscapes (though forming part of a single discipline): *landscape evaluation studies* and *preference studies* (see, for example, Gold, 1980, or Penning-Rowsell, 1981, 1982).

From a general perspective, *landscape evaluation studies*, developed within the framework of disciplines traditionally related to design, start out from the consideration that certain qualified professionals (experts) are capable of analysing scenic beauty objectively and translating its components into formulas appropriate for use in design. Although for many years such an approach predominated, it was gradually demonstrated that the appraisal of a landscape, and therefore its attractiveness, are decisively influenced by emotional and aesthetic considerations that basically depend on individuals' selective perception (Gold, 1980). Thus, from the mid-1970s, there was growing interest in studying the landscape as it is perceived by its (non-expert) users, an approach that characterises the so-called *preference studies* (Penning-Rowsell, 1981, 1982). This kind of research gained momentum in the wake of the development and consolidation of a specialised field in psychology dealing with the analysis of interrelationships between individuals and their environment (Holahan, 1986): *environmental psychology*, the area in which the present work is situated, and which has provided the frame of reference for the majority of the contributions to landscape analysis referred to here.

Psychological perspectives in studies of the appraisal of the aesthetic quality of landscapes

The group of studies referred to by the general term *preference studies* has as a common denominator the aim of determining the aesthetic value and/or quality of a given environment through the responses provided for the researcher by non-expert judges.

Although some studies have used non-linguistic procedures for eliciting these responses (such as classification and selection tasks, or psychophysiological recordings), the normal approach has been to use questionnaires. Such studies have commonly made use of batteries of scales capable of being categorized, according to the type of verbal judgement required, as follows: (a) descriptive scales, measuring spatial configuration and physical attributes of the stimuli; (b) affective scales, mainly designed to measure the reactions or mood of subjects while they are exposed to the landscapes in question; and (c) appraisal scales, indicating the aesthetic value

and/or quality of the settings. This last category has, understandably, been the most common, and the standard question asked of subjects, aimed at obtaining so-called *general preference judgements*, has been along the following lines: *In general terms, how much do you like this scene, for whatever reason?* Occasionally, the question has referred to aesthetic concepts of a more specific nature, such as *aesthetic attractiveness* or *beauty* (see, for example, Shaffer and Anderson, 1987, or Schroeder, 1987).

From a general perspective, the verbal judgements referred to above have been obtained with one of two principal objectives in mind, objectives that have originated and developed in traditionally differentiated professional fields: (1) that of environmental management, motivated by the need to solve a particular landscape problem, such as the identification of the landscape resources of a given location or to obtain some objective predictors of the evaluative judgements of users of a specific environment; and (2) that of a much more academic character, geared to the development of conceptual and theoretical frameworks for the explanation of subjects' aesthetic judgements.

In studies from the first of these fields, guided by objectives of an applied nature, it is the users that determine the aesthetic value and/or quality of the landscape; however, this is conceptualized as an external and invariant source of stimulation to which individuals respond in a uniform way. Consequently, the fundamental concern has been to analyse the relationships between the magnitude of the physical stimuli (objective attributes of the landscape) and the psychological responses to them (basically, general preference judgements), without taking account of the possible existence of any type of intermediary process that may in fact be responsible for such judgements. Is for this reason that various authors have grouped these studies under the umbrella term of *psychophysical* models (see, for example, the reviews by Daniel and Vining, 1983; Zube, Sell, and Taylor, 1982; Uzzell, 1991; or Galindo, 1994).

Despite the obvious advantages of this type of research for environmental management, such studies, as Balling and Falk (1982) point out "*are generally atheoretical, and none of them has focused on the subject of why human beings have the preferences they have*" (p. 8). And it is responding to this question that constitutes the basic objective of the other main group of studies, categorised within the literature under the general term of *experimental* (Porteous, 1982), *psychological* (Daniel

and Vining, 1983; Uzzell, 1991) or *cognitive* (Zube et al., 1982) models, the last of these descriptions being, in our view, the most precise.

While it is true that the studies ostensibly based on *cognitive* models are often partly motivated by practical considerations, the most frequent main objective of their authors has been the development of conceptual and theoretical frameworks that permit them to discover and describe the underlying psychological bases and/or processes that explain aesthetic preferences for landscapes. Starting out from the *a priori* concept that the choice of or preference for a particular environment constitutes one of the main influences on behaviour, and given that we are still ignorant of the causal relationships between specific changes in the landscape and psychological consequences directly attributable to them, researchers have begun by using a substitutional measure of these consequences. This measure is represented by the construct referred to as *environmental preference*, an object of study fundamental to this second group of studies, and which in conceptual terms is used as a complex and basically affective measure, representing the wide range of psychological benefits derived from the interaction between the individual and the environment.

The explanation of aesthetic judgements: main theoretical antecedents

The first theory-based preference studies constituted an extension to the real world of the contributions to the field of aesthetics of D.E. Berlyne, who worked from the 1960s on the development of the theses defended in his work *Conflict, Arousal and Curiosity* (1960). More specifically, Berlyne's efforts were devoted to the scientific study of aesthetic behaviour, using this term to refer to the behaviour of both the artist (*creator*) that produces a work of art and the *appreciator* (reader, listener, observer...) on seeking exposition to that work or on being exposed to it (Berlyne, 1971). The latter aspect of aesthetic behaviour is, however, that which is most commonly analysed in empirical studies.

With the publication, in 1971, of *Aesthetics and Psychobiology*, Berlyne began the development of a theoretical approach to aesthetics that he himself referred to as the *New experimental aesthetics*, characterised essentially by the following elements:

a) It is developed within an evolutionist framework, whose initial assumption consists in that aesthetic activities fulfil an important adaptive function, so that it is quite possible that they "*promote, in the*

present day, the development of valuable or even indispensable functions from a biological point of view, and that human beings are healthier with them than without them" (1971, p. 9)

- b) Focusing on the motivational aspects of behaviour, it basically analyses the capacity of certain properties of environmental stimuli to modify the level of basal activity (*arousal*) of the subject, and thus to generate a situation of uncertainty or conflict that elicits different affective responses and voluntary exploration activities (in the case of the behaviour of the "appreciator" of a work of art, such exploration would be visual, auditory, etc.). Berlyne establishes a fundamental division with regard to these voluntary behaviours, differentiating between, on the one hand, a type of exploratory behaviour aimed at increasing the arousal of the subject, which he calls *diversive exploration*, and on the other, a group of behaviours developed with the aim of decreasing this level of activity (*specific exploration*). In the first case, the subject starts out from a state of infra-stimulation, and the execution of the exploratory behaviour entails a search for activatory stimuli in the environment, in order to maintain a state of optimum arousal. In the second case, the behaviour is triggered when the individual is activated by a stimulus of great *uncertainty*, that impels its exploration, with the aim of reducing this uncertainty or satisfying the curiosity associated with the state of activation aroused by it. From the author's perspective (see, for example, Berlyne, 1967, or 1974, chapter 10) the aesthetic appraisal of an environmental pattern thus involves the action of two mechanisms working in conjunction: one of reduction of arousal, activated by stimuli relatively high in uncertainty; another of increase of arousal, which would incite subjects to search for/explore stimuli that present an intermediate level of uncertainty.
- c) Though Berlyne proposes the existence of different categories of characteristics of the environmental stimuli analysed (works of art), his theory of aesthetics emphasises only one of these categories, that of so-called collative properties, associated with inter-related attributes of the stimuli, "*such as the variations occurring along the dimensions novelty-familiarity, complexity-simplicity, surprise-predictability, ambiguity-clarity and stability-variability*" (Berlyne, 1974b, p. 5). Given their capacity to modify the level of individual arousal, the author

refers to these properties with the general term *arousal potential*, arguing, moreover, that this potential is that which lends to certain stimulus patterns (such as those for works of art) an intrinsically positive *hedonic value*.

Despite the existence of other theoretical contributions, more or less formalised (see, for example, Vygotsky, 1970; Arnheim, 1977), Berlyne's theses constituted almost until the end of the 1970s the central shaft around which the empirical study of aesthetics developed in the field of psychology. Such studies, carried out within the experimental context of the laboratory, analysed subjects' aesthetic responses (basically verbal judgements) to artificially-constructed stimulus patterns with the aim of exploring differences in these variables supposedly deriving from the collative properties of the stimuli.

It was not until the advent of social and scientific preoccupation with the quality of the environment that researchers abandoned the laboratory framework and began to focus on the analysis of the dimensions and/or attributes of real-world physical settings. Such environments would constitute the basic stimular context of works developed within the general category of *environmental aesthetics*, which includes work by researchers from a variety of disciplines (see, for example, Sadler, 1982 or, more recently, Berleant and Carlson, 1998). In the wake of Ittelson's (1978) work, this field appears in its own right, within the framework of psychology's contributions to the study of environmental appraisal, based on the 1976 study by Wohlwill, who proposed Berlyne's approach as a starting point for the establishment of general principles about subjects' aesthetic behaviour in relation to their everyday physical surroundings. Some of the main explicative contributions to the field of *environmental aesthetics* have derived from efforts to explore the viability of the concept in the context of complex and significant stimular patterns such as those involved in real-world physical environments. Such is the case of the theoretical approaches from evolutionist perspectives (e.g., Appleton, 1975a, 1975b, 1982 and 1987; Ulrich, 1977; Kaplan, 1987; Kaplan & Kaplan, 1989). These works have in common the argument that human beings, as members of a species, possess innate standards of beauty with enormous adaptive implications. Thus, we prefer and/or assess as "beautiful" those landscapes that include a series of features (in terms of both spatial configuration and specific content) that, in the course of philogenesis, have proved to be beneficial for the biological survival of our ancestors.

Environmental preference judgements as the result of biological adaptation: the specific conceptual framework of the present study

One of the most formalised conceptual frameworks, and that which includes the greatest number of empirical studies within the evolutionist perspective mentioned above is, without doubt, that proposed by the cognitive psychologists Stephen Kaplan and Rachel Kaplan (Kaplan, 1983; Kaplan, 1987; Kaplan & Kaplan, 1977, 1982, 1989). These authors have developed a model of environmental preference which, based on Berlyne's motivational perspective, has been concerned with analysing the types of basic (cognitive) needs subjects have with regard to their physical surroundings. Likewise, their model—developed within the empirical context of natural environments—takes account of the informational characteristics of the landscape (closely related to Berlyne's collative variables) which, in satisfying those needs, automatically generate responses of attraction and/or (aesthetic) preference in all individuals.

From the evolutionist approach of Kaplan and Kaplan, aesthetic judgements, and more specifically environmental preference judgements, constitute a kind of intuitive guide for behaviour which, though devoid of a motor component, increases one's disposition to approach and/or avoid a particular place; an anticipated and almost automatic appraisal (an extension of perceptual processes) that the individual makes of his/her possibilities of satisfying certain basic needs: the need to make sense and extract useful information from the environmental features and the need for involvement in the environment in question.

The proposal of the existence of global evaluative responses of an automatic nature is not unique to this theoretical formulation. Some theories of emotion have argued that organisms (human and non-human) are capable of processing automatically environmental events or stimuli as positive or negative and/or good or bad for their interests (Zajonc, 1980; Ohman, 1987), and that this corresponds to a fundamental biological principle (Martin and Levey, 1978): aversion to inappropriate environments and/or approach to physical environments that are desirable from a strictly survivalist point of view. The study of unconscious affective processes constitutes, moreover, an increasingly relevant research area within psychology (see, for example, the recent review by Ballesteros, 1998).

Apart from the above consideration, what we are trying to stress here in relation to this evolutionist approach is

the special attention it pays to the beneficial value of these automatic responses to the landscape considered as indicators of the wide range of benefits deriving from an optimum interaction between individuals and their physical environments (Kaplan and Kaplan, 1982).

The environmental attributes defined by the above model as relevant characteristics of environments that are preferred or appraised as being of great aesthetic value were initially beneficial –to our distant human ancestors– for their high adaptive value from the strict point of view of survival. Although for the contemporary human being such attributes obviously have less significance (with regard to survival), the approach in question proposes that they retain their value through their association with positive affective states and/or that they propitiate effective psychological functioning. This assertion will be the object of study in the empirical work presented below.

Once we accept, as an initial working hypothesis to be supported empirically, that preference judgements are intimately related to the effective psychological functioning of individuals, “*the next step, with regard to this question, would be to identify some of the properties that characterise such effective functioning*” (Kaplan and Kaplan, 1989, p. 68). The small, though ever-increasing, number of studies carried out with this objective in recent years have followed two basic approaches: (1) to identify the main physiological benefits associated with the contemplation of and/or contact with landscapes of high aesthetic value (see, for example, the work of Ulrich, 1982, 1984, 1986 and 1991; Parsons, 1991; Parsons, Tassinari, Ulrich, Hebl and Grossman-Alexander, 1998); (2) focusing on the analysis of the experiential (subjective) component of the well-being involved, to explore the relationships between appraisals of a general nature (environmental preference judgements) and other relevant affective responses (see, for example, the works of Herzog and Bosley, 1992; Kaplan

and Talbot, 1983; Kaplan, 1984; Kaplan and Kaplan, 1989; Staats, Gatersleben and Hartig, 1998). It is within the framework of this latter approach, developed from the immense volume of research on the environmental preference model described, that the present work is situated; what sets our study apart somewhat is the physical context in which our empirical work is based: the urban environment, common habitat of the contemporary human being.

Those studies which, like that presented here, have opted for the second perspective have linked up, moreover (usually in an implicit way), with other research priorities approached both from *environmental psychology* and, earlier, from the framework known as the *New experimental aesthetics*. Thus, Berlyne, in his 1974 review, suggests, among other things, the need to analyse how the different verbal scales (descriptive, evaluative and affective) used in aesthetics research are interrelated, with the aim of exploring the extent to which they may be reflecting a common underlying variable: “*it is often assumed that when subjects evaluate a stimulus they are informing us of the affective reactions it evokes in them. The establishment of correlations between evaluative scales and scales of internal states –moods– may show us to what extent this assumption is justified*” (1974, p. 16).

Berlyne’s suggestion, ignored by the majority of research carried out during the 1980s, was taken on board to some extent by Russell and Snodgrass (1987), who proposed descriptive categories of emotional experiences with the aim of improving the knowledge and definition of the different responses alluded to when using the term emotion. These authors differentiate, first, between what they call *relatively long-term emotional dispositions* and *short-term emotional states*, including, in this second category, *affective appraisals*, *moods*, and *emotional episodes* (see Table 1). In this context, Russell and Snodgrass have stressed, among other priorities, the

Table 1
Descriptive categories of emotional experiences proposed by Russell and Snodgrass (1987)

General type of experience	Specific category	General characterization
Long-term	Emotional disposition	Tendency to feel in a specific way in given situations and/or in the presence of certain people/objects.
Short-term	Affective appraisal	Global value judgement (assignment of sign + or –) of something/someone as <i>pleasant/unpleasant, attractive/repulsive, etc.</i>
	Mood	Affective appraisal without known specific object.
	Emotional episode	Emotional mode with its own characteristic temporal development, and including, necessarily, physiological and behavioural changes.

need to gain a deeper understanding of the experiences they call *affective appraisals*, proposing the exploration of the relationships between these appraisal responses and moods, “*remaining as an empirical question the possibility that they always accompany states of mood, and vice-versa*” (1987, p. 253).

Studies of environmental aesthetics offer, in our view, a good opportunity to explore Berlyne’s (1974) suggestion –taken up with a different perspective by Russell and Snodgrass (1987)–, making possible, moreover, an interesting connection between basic and applied psychology (a link also deemed necessary by these authors). Environmental preference judgements as conceptualized and operationalized in the reviewed studies represent a clear example of the responses Russell and Snodgrass (1987) class as affective appraisals. The works of Russell (1980) and Russell and Pratt (1980), identifying the main affective responses manifested by individuals in relation to their physical environments constitute, on the other hand, a valuable conceptual and empirical tool for approaching the study of states of mood that appear to be related to effective psychological functioning. The mentioned authors propose a model of affect that incorporates just two bipolar dimensions, considered as independent, to explain the variations in quality and intensity of environmental affect: the factors of *pleasure* and *arousal*, relevant dimensions proposed by Berlyne in the explanation of aesthetic judgements. Thus, for example, a situation that combines high levels of pleasure and arousal will be “exciting”; a situation that combines high levels of arousal and displeasure will produce “distress”; a situation that is very pleasant but not very exciting will produce “tranquillity” and, finally, a situation with low levels of both arousal and pleasure will be “boring”. In this way, Russell and Pratt reject the need to consider the power-dominance dimension, sustained empirically by the wealth of studies on semantic differential developed by Osgood and collaborators (Osgood, Suci and Tannenbaum, 1957).

Research objectives

The context outlined constitutes the conceptual and methodological platform of the empirical study presented here, whose general objective is to explore the nature of aesthetic judgements within the framework of the evolutionist positions defended by Kaplan and Kaplan’s environmental preference model, referred to above (Kaplan, 1983; Kaplan, 1987; Kaplan and Kaplan, 1977, 1982

and 1989). More specifically, we have attempted to explore the viability of the initial working hypothesis on which this model is based with regard to the benefits of aesthetic judgements. The basic specific objective of the study has therefore been to define and analyse the associations that can be established between these judgements and other affective responses that may be related to psychological wellbeing. At the same time, we have sought to consider some of the research topics that various authors (Berlyne, 1974; Russell and Snodgrass, 1987) have proposed for increasing understanding (or better defining) the affective experiences to which they refer in using a less restricted sense of the term *emotion*. It is also important to point out that the physical context of this study is constituted by the city environment, a context practically ignored by the studies mentioned.

Finally, we should mention that these objectives fall within the framework of a much wider research project designed with the aim of making a detailed analysis of the main variables –and related psychological processes– that appear to be involved in aesthetic references for urban environments (Galindo, 1994).

The general methodological strategy followed for achieving the aims of this research is described below.

METHOD

Participants

The population of interest for the general research of which this study forms part was constituted by the adolescents living in the city of Seville, with ages ranging from 15 to 19 years, and attending any of the secondary schools (public and private) in the city.

A multi-stage, stratified random sampling was carried out by clusters, and a final total of 402 subjects (213 males and 189 females) was obtained, divided into 67 clusters (of six sub-units each) and distributed across 50 different schools. This equates to a set of 268 subjects through simple random sampling, and implies a sampling error of 6.05% for a confidence level of 95.5% on global data.

Questionnaire

In order to fulfil the objectives of the present study, we used a set of items extracted from a more comprehensive questionnaire employed in a doctoral thesis (Galindo, 1994). This questionnaire included a set of 50 colour photographs (13 x 17 cm) of public environments in the city of Seville, and was designed to be administered by means of structured individual interview, by qualified

interviewers. The data-collection instrument comprised, therefore, two large blocks of content: one pictorial (photographs), the other verbal (the questionnaire itself).

The pictorial material was selected from a collection of 525 photographs of the city taken by the first author, using a series of pre-established criteria (for precise details, see Galindo, 1994). The photographs of the final environmental sample were randomly assigned, for the fieldwork, to two different subsets of 25 images (collection A and collection B). The two collections were presented independently in a ring binder on white, plastic-covered pages measuring 31 x 23 cm. Each page presented a single photograph, in order to avoid the simultaneous observation of more than one photograph by subjects. Underneath each photograph was a small label of white card bearing the legend *location number... (x)*; these numbers were used as identification codes for the scenes. The order of appearance of the photographs (and therefore the corresponding identification number) was decided, for both collections, by a draw. Each one of the collections was assessed by a similar number of subjects. Thus, collection A was assigned at random to 33 groups (clusters) of the total of 67; collection B was assigned to 33 others; and finally, in one of the selected groups a combination of the two collections was used.

The questionnaire was structured around different blocks of questions designed for the interviewees' tasks. The tasks and questions selected for this work were as follows:

- a) In the first place, following the standard format used in those studies that have employed linguistic procedures for obtaining aesthetic preference responses, subjects were asked to assess the set of cityscapes randomly assigned to them (collection A or B), according to their personal preference or taste (*general preference judgements*). The specific question posed was: "In general, how much do you like this scene?". This question was repeated 25 times (once for each photograph assessed). Responses were to be made on a numerical scale from 1 ("not at all") to 5 ("very much").
- b) A second task that forms part of the present study consisted in the appraisal of a single photograph (randomly assigned to the subject) in terms of the affective variables selected. In the framework of the model of affect proposed by Russell (1980) and Russell and Pratt (1981) and adopted here, the authors advise the use of self-report measures incorporating 10-word indices for representing each one of

the two dimensions identified; nevertheless, other works with wider objectives have used, in order to reduce fatigue in interviewees, more simplified batteries of affective scales (see, for example, the work of Hull and Harvey, 1989, or that of Sheet and Manzer, 1991). We have used this latter option in our study, in which we have employed only the most representative terms corresponding to states of mood and/or affective experiences resulting from the combination of the pleasure and arousal dimensions in question (excited/stimulated, relaxed, bored and anxious/distressed) and which, moreover, have in several studies obtained better saturation in these factors. To this set of words we have added the terms "comfortable", closely associated with the pleasure dimension and incorporated in all the studies on environmental meaning, and "safe". Despite the fact that this latter term, related to the power dimension identified in the work of Osgood (*op. cit*), lies outside the framework of the circumflex conceptual model adopted, the results of various studies carried out in the context of urban environments suggested the relevance of its exploration in our study (Herzog, 1987; Herzog and Smith, 1989; Corraliza, 1989). Thus, following the procedure developed by Ward and Russell (1981) and Hull and Harvey (1989), subjects were asked to imagine they were in the places represented in the photographs and to state to what extent they would feel: a) "comfortable"; b) "excited/stimulated"; c) "distressed/anxious"; d) "bored"; e) "relaxed"; and f) "safe". Also, within the framework of this task in relation to a single scene, subjects were asked to respond to the following question, which like the others required a numerical response on a 1 to 5 scale: *Is this a pretty place?*. This question incorporated, on the one hand, one of the terms (*pretty*) that Russell and Pratt (1980) suggested as a fundamental component of the pleasure dimension; on the other hand, it constituted an operational definition of aesthetic response used as an alternative measure (alternative to that selected for the first task) in some studies (Brush, 1979; Shaffer and Anderson, 1985; Schroeder, 1987). Its use seemed appropriate in this study, given that some research has suggested the possibility that there are different dimensions of variability among the different responses studied, depending on the introduction of one or other type of judgement (general preference judgements and aesthetic attractiveness judgements,

respectively) (Craik, 1968, 1972, 1986; Craik and McKechnie, 1974).

c) Finally, with the aim of discovering whether among the judgements emitted spontaneously by subjects there appeared some reference to the affective variables specifically analysed by this study, as well as defining the existence of predictors of aesthetic judgements ignored in the conceptual models analysed in the cited doctoral thesis (the latter objective being unrelated to the present work), the questionnaire incorporated an item not commonly used in preference studies developed within the framework of the cognitive models. In this question, subjects were asked to give the three main reasons why they had given a scene a particular score on the scale (1 to 5). These reasons were asked for only in relation to one of the landscapes, that which was presented in the photograph assigned randomly to be assessed in all the affective variables. Moreover, this information was not used when subjects gave a medium score (level 3) to the photograph. In this way, it was possible to obtain two relevant sub-groups of landscapes (liked “very much” and “very little”). The specific question asked was as follows: “... and finally for this scene, and summarising briefly your opinions on it, please state, in order of importance, the three main reasons why you like this scene... “so little” (scores 1 and 2) or “so much” (scores 4 and 5)”.

In order to facilitate analysis of the data obtained with this questionnaire, the information was considered as a set of six questions: first, second and third reason why subjects liked the assessed environment “not at all-very little” (reasons for a low preference score); first, second and third reason why subjects like the assessed environment “quite a lot-very much” (reasons for a high preference score). The categorization and codification of responses was carried out independently for each group. Thus, the categories resulting from analysis of the information related to low preference scores were called

“detractors” from aesthetic quality; the categories resulting from analysis of the information related to high preference scores were called “determinants”. The results of this part of the research will be presented in accordance with this differentiation.

ANALYSIS AND RESULTS

With the aim of achieving the research objectives of this study, three types of analysis were carried out: (a) first, an analysis of the correlation (using Pearson’s correlation coefficient r) between the aesthetic judgements and the affective responses selected; (b) subsequently, a factorial analysis (using varimax rotation as the specific procedure), which constituted, in fact, a set of three consecutive analyses: in the first of them, together with the six affective responses of interest, only one of the aesthetic judgements used was incorporated –that of *general preference judgements*; in the second, these judgements were substituted by those of perceived aesthetic attractiveness; finally a third analysis incorporated both types of aesthetic response. The purpose of this was to take into account the possibility that there exist different dimensions of variability depending on the introduction of one or other type of judgement; (c) finally, with the responses for the open question we developed an exclusively descriptive analysis.

a) Table 2, presented below, shows the results obtained with the correlation analyses, using Pearson’s r coefficient. Some interesting data can be found in the table. First, although the values of the correlation coefficients identified are, in general, relatively high, the responses of “comfortable” ($r = .58$ and $.66$, $p < .001$, for *general preference* and *perceived aesthetic attractiveness*, respectively) and “excitement” ($r = .58$ and $.62$, $p < .001$) present the highest coefficients with the affective judgements. In this regard, it is the associations established with *aesthetic attractiveness* that obtain, in all cases, the highest values. After “comfortable” and “excitement” it is

Table 2
Correlation matrix resulting from the association between the two measures of aesthetic judgements and affective responses (Pearson’s r)

AESTHETIC JUDGEMENTS	AFFECTIVE		RESPONSES (*)			
	Comfortableness	Excitement	Distress	Boredom	Tranquillity	Safety
General preference	.587	.587	-.337	-.380	.381	.346
Perceived aesthetic attractiveness	.667	.625	-.390	-.430	.432	.372

(N=402)

(*) All associations were significant ($p < .001$)

“tranquillity” ($r = .38$ and $.43$) “boredom” ($r = .38$ and $-.45$), the latter coefficient with a negative sign, that present the highest levels of association with aesthetic judgements. Finally “distress” and “safety” (the former, obviously, with negative sign) present quite similar coefficients.

b) Table 3 shows the main results obtained in the three analyses carried out. Given our objective of grouping with high saturations the smallest possible number of variables (simplicity criterion), a varimax type rotation was performed.

As it can be seen from Table 3, the fact of using preference judgements or perceived attractiveness appraisals to represent the aesthetic judgements used in the analysis causes no significant variation in the configuration of the factors, the variance they explain, or the saturation that characterises the variables within them. In the three cases mentioned, one factor (factor I) groups more than 50% of the explained variance in the variables involved.

This factor includes, in addition to the aesthetic judgements, the variables “tranquillity”, “comfortableness” “excitement” and “safety”, the first two with very high saturations in this factor (.82 and .73, respectively). With very low saturations, and with negative sign, are “distress” and “boredom” ($-.17$ and $-.16$). “Distress” and “boredom”, however, are clearly the most important elements with regard to the second factor identified in the analysis, in which they present the highest saturations found in the entire set of variables (over .80). Likewise, it is curious to observe how “excitement” and “comfortableness”

(in that order) are the second and third variables with acceptable saturations (but with negative sign) in this second identified factor (around .50). Nevertheless, this factor is clearly differentiated from the previous one by its lesser relevance: with an eigenvalue of 1 (compared to an eigenvalue of 4 that characterises the previous factor), it explains only around 14% of the variance (compared to the previous factor’s much higher percentage: 53%). Finally, it should be stated that the two factors together explain almost 70% of variability in the appraisals.

c) With the responses obtained in the open question we defined, first, a group of basic categories of determinants and detractors that were subsequently regrouped into wider thematic sets. Tables 4 and 5 present these general categories, accompanied by the basic categories they include. The measurement units of reference for drawing up these tables were not subjects, but rather their responses, independently of the order in which they were expressed. It should be remembered, moreover, in reading these tables, that the question analysed was not asked of subjects who gave a medium score in preference (3 on the scale used) for the scene randomly assigned to them. Thus, the table of determinants shows only the responses of 101 subjects (who gave scores of 4 and 5 on the scale), and the table of detractors includes only the responses of 193 subjects (who gave scores of 1 and 2 on the scale).

As Table 4 shows, almost a quarter of all reasons given for high scores in preference are related to what we

Table 3
Summary of results obtained in factorial analyses of aesthetic judgements and the set of affective variables used in the study

	AESTHETIC JUDGEMENTS USED IN THE ANALYSIS					
	First analysis		Second analysis		Third analysis	
	General preference		Aesthetic attractiveness		Preference and attraction	
	Factor I	Factor II	Factor I	Factor II	Factor I	Factor II
EIGENVALUE	3.61	1.04	3.70	1.03	4.24	
% variance explained	51.6	14.9	52.9	14.8	53.	13.5
General preference	.69	-.32			.77	-.26
Aesthetic attractiveness						
Tranquillity	.81	.07	.82	.07	.74	.07
Comfortableness	.72	-.47	.73	-.47	.73	-.44
Excitement	.60	-.56	.59	-.56	.63	-.52
Safety	.59	-.22	.58	-.22	.52	-.24
Distress	-.17	.85	-.17	.85	-.17	.86
Boredom	-.16	.87	-.16	.87	-.19	.87

might call the level of *naturalness* of the scene.

The evocation, on contemplating a given environment, of positive feelings in the observer constitutes the second most important group of reasons expressed (20% of the total).

The third highest number of responses obtained is found for those related to the spatial structure and/or organisational characteristics of the elements in the different scenes (16.2% of the total reasons expressed).

Reasons related to the level of cleanliness and/or maintenance of the environment assessed constitute the fourth category of determinants mentioned. In fifth place we find a new group: reasons that include a socio-cultural dimension (not present among the reasons given as detractors from visual quality). These reasons refer to either the historical or representative character of the scene or to its familiarity (being known to the subject, for example).

A final group of reasons is related to the suitability of the location for carrying out certain activities –mainly recreational– of interest to the subject-observer (approximately 7% of the total responses obtained).

As far as detractors from visual quality are concerned, as Table 5 shows, the general category called “lack of naturalness” –the opposite semantic pole to the “natural-

ness” category in the previous Table– occupies, like its positive counterpart, first place in terms of total responses, and with a similar percentage (around 24%).

Second place in this table is occupied by a set of reasons related to certain social characteristics of the environments assessed, which includes a group of responses closely linked to certain feelings and/or moods (scene “no life”; “unsafe”; etc.). This type of response is, however, perfectly defined in the fourth general category identified, shown in the table with the generic label “negative emotions” –the opposite semantic pole to the category “positive emotions” in Table 4.

DISCUSSION

Although perceived aesthetic quality has been considered as “*an emotional judgement that includes appraisal and feelings*” (Nasar, 1988, p. 301), as Sheets and Manzer (1991) point out, various researchers have concentrated on the analysis and measurement of appraisal (*general preference*), paying far less attention to the identification of these feelings (or affective responses

REASONS GIVEN	Frequency	%
Existence of vegetation	58	20.00
Absence of traffic/noise/pollution	9	3.10
Natural place	5	1.72
GENERAL CATEGORY I: NATURALNESS	72	24.82
Maintenance/conservation	9	3.10
Cleanliness/Hygiene	16	5.52
Quality of materials	13	4.48
GENERAL CATEGORY II: MAINTENANCE	38	13.10
Feelings of tranquillity	37	12.76
Comfortable/pleasant feelings	8	4.76
Aesthetic feelings	13	4.48
GENERAL CATEGORY III: POSITIVE AFFECT	58	20.00
Openness/wide area	28	9.66
Light/clarity	7	2.41
Harmonious organisation of elements	6	2.07
Central location/good communications	6	2.07
GENERAL CATEGORY IV: SPATIAL ORGANIZATION	47	16.21
Historical/representative	17	5.86
Known/familiar	9	3.10
GENERAL CATEGORY V: SOCIOCULTURAL	26	8.96
Conducive to desired activities	20	6.90
GENERAL CATEGORY VI: SUITABILITY FOR ACTIVITIES	20	6.90
Other reasons	29	10.00
TOTAL	2.90	

REASONS GIVEN	Frequency	%
Lack of vegetation	69	12.48
Traffic/noise/pollution	23	4.16
Built-up/large buildings	17	3.07
Presence of roads	12	2.17
Much-frequented/common urban space	6	1.09
Very artificial/urban location	5	0.90
GENERAL CATEGORY I: LACK OF NATURALNESS	135	23.87
Lonely place	52	9.40
No “life”/no atmosphere	19	3.44
Dangerous/unsafe place	18	3.26
Poor place (low social status)	16	2.89
Crowded/overpopulated place	21	3.80
GENERAL CATEGORY II: SOCIAL CHARACTERISTICS	126	22.79
Deterioration/neglect/abandonment	64	11.57
Dirty/unhygienic	27	4.88
GENERAL CATEGORY III: LACK OF MAINTENANCE	91	16.45
Feelings of sadness/distress	26	4.70
Unpleasant/uncomfortable feelings	9	1.63
Boredom	23	4.16
Lack of aesthetic feelings	18	3.26
GENERAL CATEGORY IV: NEGATIVE AFFECT	76	13.75
Cramped area/lack of space	17	3.07
Dark/sombre place	23	4.16
Disorganisation of elements in the scene	14	2.53
Peripheral urban location	16	2.89
GENERAL CATEGORY V: SPATIAL ORGANISATION	70	12.65
Not conducive to desired activities	14	2.53
GENERAL CATEGORY VI: SUITABILITY FOR ACTIVITIES	14	2.53
Other reasons	44	7.96
TOTALS	553	

implicitly associated with appraisal responses). The latter consideration is, nevertheless, fundamental if we are to increase our knowledge of the nature of aesthetic judgements. In this respect, the results presented here allow us to make some interesting inferences.

Firstly, the results of the correlation analyses clearly reflect the important associations of these aesthetic judgements with each of the six affective responses included in the study. However, it is the feelings “comfortable” ($r = .58$ and $.66$, $p < .001$, for general preference and aesthetic attractiveness, respectively) and “excitement” ($r = .58$ and $.62$, $p < .001$) that present the highest correlation coefficients with the judgements involved. It should be remembered, in this context, that these terms are those most representative of the pleasure and arousal dimensions as defined in numerous studies. These are followed by “tranquillity” ($r = .38$ and $.43$), “boredom” ($r = -.38$ and $-.45$) “distress” ($r = -.33$ and $-.39$) and “safety” ($r = .34$ and $.37$).

The clear relationship that appears to exist between the aesthetic judgements and affective responses considered is also seen in the information obtained through the open questions of the questionnaire referring to the “reasons” for preferences. Thus, for example, the feelings of “tranquillity” and “comfortableness” evoked by the evaluated environments constitute 20% of total reasons expressed by subjects to explain high scores in general preference (see Table 3). On the other hand, approximately 15% of the total reasons provided to explain low preference scores make explicit reference to feelings of “sadness”, “uncomfortable” and “boredom” evoked by the scene. These findings are in accordance with those presented in the few works that have incorporated open questions to obtain information on the characteristics of the environments most and least preferred by subjects and the reasons for such appraisals (see, for example, White and Dunn, 1976, or Chokor and Mene, 1992).

The results of the correlation analyses presented here suggest that aesthetic responses play an important role, from an affective point of view. This is inferred from the fact that these responses are associated simultaneously with the two sets of experiences that appear to constitute the main dimensions characterising the affective appraisals given by subjects in relation to physical environments: the *pleasure* dimension and the *arousal* dimension (Russell and Pratt, 1980; Ward and Russell, 1981; Hull and Harvey, 1989). These dimensions constitute the central axes of the *affect model* presented by Russell and Pratt (1980), in which they appear conceptualised as two independent factors, capable of being

studied separately. Likewise, these are the two factors that various studies carried out by Berlyne and collaborators, in the context of works of art and artificially-generated stimuli, have defined as the two fundamental affective dimensions –independent in nature– within the structure of aesthetic responses (see, principally, Crozier, 1974, and Berlyne, 1974, chap. 5). Despite these findings, studies on environmental aesthetics have concentrated almost exclusively on the pleasure dimension, paying little or no attention to the role of arousal.

The results of the analyses carried out with the two types of aesthetic judgement used in the study and the set of affective variables employed identified the existence of two orthogonal factors. In each of them, variables associated with the two dimensions considered as independent by the cited authors were found to saturate. Nevertheless, these factors were found to be totally different as regards their respective participation in the explanation of variability of the responses and the sign of this participation.

Thus, factor I –which explains 53% of the variance– groups, with saturations over 0.5, the two measures of aesthetic appreciation behaviour analysed, plus the affective responses of (in order of saturation in the factor) “tranquillity” (.80), “comfortable” (.70), “excitement” (.60) and “safety” (.60). With extremely low saturations, but with negative sign, we find the responses of “distress” and “boredom”.

Factor II, with a much lower contribution to explained variance (15%), and comprising the affective responses of “distress” and “boredom” (both with saturations of .85), and those of “excitement” (saturation .55, but with negative sign), appears to constitute the reverse of the previous factor. That is, these factors resemble the two sides of the same coin; the two extreme profiles of a single evaluational process that seems to be represented by an affective continuum with two poles:

- a) one representing scenes with high aesthetic value (factor I).
- b) another representing scenes with low aesthetic value (factor II).

These profiles can be clearly seen in Figure 1, which represents graphically the mean scores characterising, within a set of affective responses, two of the environments analysed in the present study. One constitutes the prototypical profile of the scenes that obtained a high score for aesthetic value; the other, at the opposite pole, represents the scenes with low aesthetic value scores.

Some of the conclusions drawn in the works of Berlyne

about the structure of aesthetic judgements and their relationship to arousal (and to *specific* and *diversive* exploratory behaviour) may help, initially, to explain the fact that the profiles represented in Figure 1 are shaped by variables linked to the two basic components of meaning –from the point of view of the affective analysis outlined here. As pointed out earlier, such works have revealed the existence of two factors (closely related to the *pleasure* and *arousal* dimensions of Russell and Pratt's affect model) that constitute, in Berlyne's view, the two structural dimensions of aesthetic judgements: the first, "uncertainty-arousal", strongly related to *specific* exploratory behaviour; the second, called "hedonic tone", closely linked to *diversive* exploratory behaviour.

In Berlyne's opinion, the aesthetic appreciation of a stimulus covers both factors; the aesthetic response would translate –as mentioned in the introduction– the action of two types of mechanism working on it in combination: a) a mechanism for reducing arousal, related to the first factor; b) a mechanism for increasing arousal, related to the second factor. In both cases, the emergence of these mechanisms would be explained exclusively, according to this author, by the structural characteristics of the stimuli. Thus, the first mechanism would be elicited by stimuli presenting high levels of "uncertainty", which would incite the subject to reduce the resulting high level of activation; in the second case the lack of appropriate stimulation (absence of "uncertainty" in the stimulus patterns) would lead to a search for activation, which would result, finally, in the achievement of an optimum level of arousal. These mechanisms are considered as mutually exclusive. The results of our analyses, however, suggest that these mechanisms may constitute complementary processes structured over time. This suggestion, at odds with Berlyne's arguments (and which calls into question, moreover, the idea that only

structural properties of the stimuli are responsible for these mechanisms), may be explained, in a general way, by the concept of preference judgements offered by authors that defend the informational model.

The preference expressed by an individual with respect to a given environment is considered, from the perspective of the mentioned model, as an expression of the *anticipated* (and practically automatic) appraisal made by that individual of his/her possibilities of obtaining satisfaction in relation to it. That is, aesthetic judgements would constitute a kind of intuitive guide to behaviour that orients human beings towards appropriate environments and diverts them from inappropriate ones, from the point of view of their basic (cognitive) needs, understanding and exploration.

On the basis of the above, the following arguments will be articulated within the stimular framework of urban life, described as a context capable of provoking simultaneously "monotony" and "overload" (Milgram, 1970; Rodríguez Sanabra, 1987). From the perspective of affective analysis adopted here, it can be considered as an important affective necessity that a given environment offers the possibility, not only of increasing, but also of decreasing arousal levels, according to the requirements of the subject at a given moment: a) to escape from the "boredom" that often results from the uniformity of the physical setting of the city (possibility of "feeling stimulation/excitement"); b) to alleviate the tremendous overload that urban settings can cause (possibility of feeling "relaxed"). This line of argument leads to the conclusion, obviously, that it is likely to be those environments capable of eliciting both responses –at different times– that will be most highly valued by subjects. From this perspective, preference judgements as conceptualised by Kaplan and Kaplan might be considered as an anticipation of exploratory behaviours (Berlyne), be they specific or diversive.

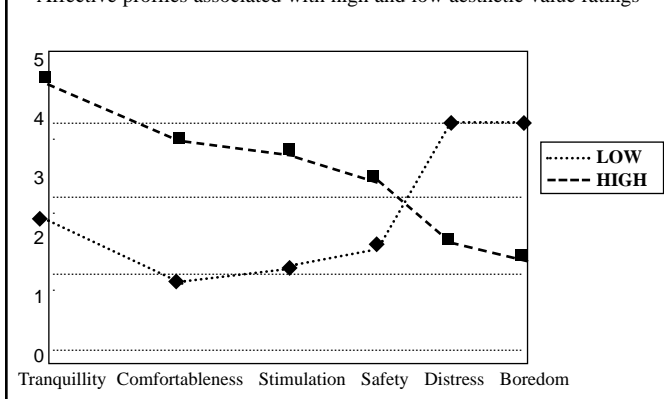
The above suggestion, based on the configuration of the variables from this study, is in line with the results offered by the work of Hull and Revell (1989), carried out in the stimular context of various suburban settings shown in photographs: subjects preferred those spaces that evoked, simultaneously, feelings of "comfort", "pleasantness" (*pleasure* factor) and "excitement/stimulation", "being alive" (*arousal* factor).

SYNTHESIS AND GENERAL CONCLUSIONS

Having described and analysed our principal findings, we shall proceed to draw the main general conclusions

Figure 1

Affective profiles associated with high and low aesthetic value ratings



and to point to some specific aspects that require attention in future research.

The basic objective of this study was to investigate possible relationships between aesthetic judgements and other affective responses supposedly related to subjects' psychological well-being. It has been possible, from the data obtained, to identify such a relationship. Thus, the results support the basic hypothesis underlying Kaplan and Kaplan's informational model of environmental preference, previously defended by Berlyne when suggesting the possibility that aesthetic activities (such as the appraisal behaviour analysed here) "*promote certain biological functions, and that human beings are healthier with them than without them*" (1971, p. 9). Aesthetic judgements appear, indeed, to be associated with the two basic dimensions characterising the affective appraisals manifested by individuals in relation to their physical environments, the dimensions of *pleasure* and *arousal*.

It has also been the intention of this study to improve knowledge of the relationships between different experiences considered as affective: *appraisal responses*, manifested in this study in general preference judgements (aesthetic judgements) and the so-called *states of mood*. In this way we attempted to respond to the question posed, in the first place, in the context of experimental aesthetics studies, by Berlyne when he stated: "*it is often assumed that when subjects evaluate a stimulus they are informing us of the affective reactions it evokes in them. The establishment of correlations between evaluative scales and scales of internal states –moods– may show us to what extent this assumption is justified*" (1974, p. 16). The data presented provide empirical justification for this assumption. In the same line as Berlyne –though in another context and in a different way– Russell and Snodgrass (1987) stressed the need to increase knowledge of these appraisal responses (which they call affective appraisals), pointing out that "*there remains the empirical question as to the possibility that they always accompany states of mood, and vice-versa*" (*op. cit.*, p. 253). Our data allow us, provisionally, to state that, in the case of aesthetic (appraisal) behaviour they would seem to be inseparable. Likewise, the results suggest the possibility that both responses form part of a *pluriaffective* construct that incorporates variables related to the two basic dimensions of the global meaning that physical environments hold for individuals (*pleasure* and *arousal*).

On the basis of the above, the aesthetic response a

given environment may evoke would appear to be an important index of measurement of this construct that reflects the level of fit between physical contexts and some of the principal affective needs of individuals in relation to them. The differential role, within the context of this construct, that may be played by the two measures of aesthetic response used in this study is less clear, and constitutes one of the aspects to be considered in future studies on environmental aesthetics. Likewise, it is necessary to gain more profound knowledge of the relationship between them established in the present work. The combination of self-report and physiological measures may prove to be of great help in this task. Finally, it should be mentioned that the data presented in relation to the construct in question invite a thorough analysis of the mechanisms that appear to link, in a single process, the two dimensions of variability (*pleasure* and *arousal*) identified as independent in nature by previous research.

REFERENCES

- Appleton, J. (1975a). The experience of landscape. London: John Wiley & Sons, Ltd.
- Appleton, J. (1975b). Landscape evaluation: The theoretical vacuum. *Transactions of the Institute of British Geographers*, 66, 120-123.
- Appleton, J. (1982). Pleasure and the perception of habitat: a conceptual framework. In B. Sadler and A. Carlson (eds.). *Environmental Aesthetics: Essays in Interpretation* (pp. 27-45). *Western Geographical Series*, 20. University of Victoria: Department of Geography, B.C.
- Appleton, J. (1987). Landscape as Prospect and Refuge. In J.A. Jackle. *The visual elements of landscape* (pp. 39-74). Amherst: The University of Massachusetts Press.
- Arnheim, R. (1977). *The dynamics of architectural form*. Berkeley: University of California Press.
- Ballesteros, S. (1998). ¿Existen procesos afectivos no conscientes? Evidencia a partir del efecto de la mera exposición y del priming afectivo. *Psicotema*, 10(3), 551-570.
- Balling, J.D. and Falk, J.H. (1982). Development of visual preference for natural environments. *Environment and Behavior*, 14 (1), 5-28.
- Berleant, A. and Carlson, A. (1998). Environmental Aesthetic (Introduction). *The Journal of Aesthetics and Art Criticism*, 56 (2), 97-100.
- Berlyne, D.E. (1960). *Conflict, Arousal and Curiosity*. New York: McGraw Hill.

- Berlyne, D.E. (1971). *Aesthetics and Psychobiology*. New York: Appleton-Century.
- Berlyne, D.E. (ed.) (1974a). *Studies in the New Experimental Aesthetics: Steps toward an Objective Psychology of Aesthetic Appreciation*. New York: Halstead.
- Berlyne, D.E. (1974b). The new experimental aesthetics. In D.E. Berlyne (Ed.). *Studies in the New Experimental Aesthetics: Steps toward an Objective Psychology of Aesthetic Appreciation* (pp. 1-25). New York: Halstead.
- Brush, R.O. (1979). The attractiveness of woodlands: Perceptions of forest landowners in Massachusetts. *Forest Science*, 25, 495-506.
- Chokor, B.A. and Mene, S. (1992) An assessment of Preference for Landscapes in the Developing World: Case Study of Warri, Nigeria, and Environs. *Journal of Environmental Management*, 34, 237-256.
- Corraliza, J.A. (1989). El misterio y la preferencia de paisajes urbanos. Un estudio experimental. Proceedings of II Jornadas de Psicología Ambiental (Palma de Mallorca).
- Craik, K.H. (1968). The comprehension of everyday physical environment. *Journal of American Institute of Planners*, 34, 29-37.
- Craik, K.H. (1972). Psychological Factors in Landscape Appraisal. *Environment and Behavior*, 4, 255-266.
- Craik, K.H. (1986). Psychological reflections on landscape. In E.C. Penning-Roswell and D. Lowenthal (Coords.). *Landscape meanings and values* (pp. 48-64). London: Unwin Hyman.
- Craik, K.H. and Mckechnie, G.H. (1974). Perception on Environmental quality: Preferential judgments versus comparative appraisals. Berkeley: CA, Institute of Personality Assessment and Research.
- Daniel, T.C. and Vining, J. (1983). Methodological Issues in the assessment of Landscape Quality. In I. Altman and J.F. Wohlwill (eds.). *Human Behavior and Environment. Advances in theory and Research, Volume 6* (pp. 39-84). New York/London: Plenum Press.
- Galindo, M.P. (1994). Evaluación de la preferencia ambiental de paisajes urbanos. Hacia un modelo psicosocial de carácter integrador. Research thesis (unpublished). Universidad de Sevilla.
- Gibson, J.J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin Company.
- Gold, J.R. (1980). *An Introduction to Behavioural Geography*. Oxford: University Press.
- Herzog, T.R. (1987). A cognitive analysis of preference for natural environments: Mountains, canyons and deserts. *Landscape Journal*, 6, 140-52.
- Herzog, T.R. and Bosley, P.J. (1992). Tranquillity and preference as affective qualities of natural environments. *Journal of Environmental Psychology*, 12, 115-127.
- Herzog, T.R. and Smith, G.A. (1988). Danger, Mystery and environmental preference. *Environment and Behavior*, 20 (3), 320-344.
- Holahan, CH. J. (1986). Environmental Psychology. *Annual Review of Psychology*, 37, 381-407.
- Hull, R.B. and Harvey, A. (1989). Explaining the emotion people experience in suburban parks. *Environment and Behavior*, 21 (3), 323-345.
- Ittelson, W.H. (1973). Environmental Perception and Contemporary Perceptual Theory. In W.H. Ittelson (ed.). *Environment and Cognition* (pp. 1-19). New York: Seminar Press.
- Ittelson, W.H. (1978). Environmental perception and urban experience. *Environment and Behavior*, 10 (2), 193-213.
- Kaplan, R.(1983). The role of Nature in the Urban Context. In I. Altman and J.F. Wohlwill (eds.). *Human Behavior and Environment. Advances in Theory and Research, Vol. 6* (pp. 127-61). New York/London: Plenum Press.
- Kaplan, R. (1984). Wilderness perception and psychological benefits: An analysis of a continuing program. *Leisure Sciences*, 6, 271-290.
- Kaplan, R. and Kaplan, S.(1989). *The Experience of Nature: a psychological perspective*. New York: Cambridge University Press.
- Kaplan, S. (1987). Aesthetics, affect and cognition. Environment preference from an evolutionary perspective. *Environment and Behavior* 19 (1), 3-32.
- Kaplan, S. and Kaplan, R. (1977). The experience of the environment. *Man-Environment Systems*, 7, 300-305.
- Kaplan, S. and Kaplan, R. (1982). *Cognition and Environment. Functioning in an uncertain world*. New York: Praeger Publishers.
- Kaplan, S. and Talbot, J.F. (1983). Psychological benefits of a wilderness experience. In I. Altman and J.F. Wohlwill (Eds.). *Behavior and the natural environment* (pp. 163-206). New York: Plenum.
- Martin , I. and Levey, (1978). Evaluative conditioning. *Advances in behaviour research and therapy, Vol. 1*, 57-101.
- Milgram, (1970). The experience of living in cities. *Science*, 167, 1461-1468.
- Nasar, J.L. (1988). Visual preferences in urban street scenes: a cross-cultural comparison between Japan

- and the United States. In J.L. Nasar (ed.). *Environmental Aesthetic. Theory, research and applications* (pp. 260-274). New York/Cambridge: Cambridge University Press.
- Ohman, A. (1987). The psychophysiology of emotion: an evolutionary-cognitive perspective. *Advances in Psychophysiology*, 2, 79-127
- Osgood, C.E.; Suci, C.J. and Tannenbaum, P.H. (1957). *The measurement of meaning*. Urbana III: University of Illinois.
- Parsons, R. (1991). The potential influences of environmental perception on human health. *Journal of Environmental Psychology*, 11(1), 1-23.
- Parsons, R.; Tassinary, R.; Ulrich, R.; Hebl, M. and Grossman-Alexander, M. (1998). The view from the road: implications for stress recovery and immunization. *Journal of Environmental Psychology*, 18(2), 113-140.
- Penning-Rowsell, E.C. (1981). Fluctuating fortunes in gauging landscape. *Progress in human geography*, 5, 35-41.
- Penning-Rowsell, E.C. (1982). A public preference evaluation of landscape quality. *Regional Studies*, 16(2), 97-112.
- Porteous, J.D. (1982 b). Urban environmental Aesthetics. In B. Sadler and A. Carlson (Eds.). *Environmental aesthetics: essays in interpretation* (pp. 67-95). Western Geographical Series, 20. Victoria, B.C.: Department of Geography, University of Victoria.
- Russell, J.A. (1980). The circumplex model of affect. *Journal of Personality and Social Psychology*, 39, 1161-1178.
- Russell, J.A. and Pratt, G. (1980). A Description of the Affective quality attributed to environments. *Journal of Personality and Social Psychology*, 38 (2), 311-322. New York: Wiley.
- Russell, J.A. and Snodgras (1987). Emotion and the Environment. In D. Stokols and I. Altman (Eds.). *Handbook of Environmental Psychology*, Vol. 1, (245-280). New York: Wiley & Sons.
- Sadler, B. (1982). Environmental aesthetics in interdisciplinary perspective. In B. Sadler and A. Carlson (Eds.). *Environmental Aesthetics. Essays in Interpretation* (pp. 1-25). Western Geographical Series, vol. 20. Victoria, Canada: Department of Geography, University of Victoria.
- Schroeder, H.W. (1987). Dimensions of variation in urban park preference: A psychophysical analysis. *Journal of Environmental Psychology*, 7, 123-141.
- Shaffer, G.S. and Anderson, L. M. (1985). Perceptions of the security and attractiveness of urban parking lots. *Journal of Environmental Psychology*, 5(4), 311-23.
- Sheets, U.L. and Manzer, C.D. (1991). Affect, cognition, and urban vegetation. Some effects of adding trees along city streets. *Environment and Behavior*, 23 (3), 285-304.
- Staats, H.; Gatersleben, B. and Hartig, T. (1998). Change in mood as a function of environmental design: arousal and pleasure on a simulated forest hike. *Journal of Environmental Psychology*, 17(4), 283-300.
- Ulrich, R.S. (1977). Visual landscape preference: A model and application. *Man-Environment Systems*, 7, 279-293.
- Ulrich, R.S. (1984). View through a window may influence recovery from surgery. *Science*, 224, 420-421.
- Ulrich, R.S. (1986). Human responses to vegetation and landscapes. *Landscape and Urban Planning*, 13, 29-44.
- Ulrich, R.G. (1992). La Salud y el Paisaje. In A. Sáenz de Miera (coord.). *La Sierra de Guadarrama. Naturaleza, paisaje y aire de Madrid* (pp. 235-248). Madrid: Agencia de Medio Ambiente de la Comunidad de Madrid.
- Uzzell, D.L. (1991). Environmental Psychological Perspectives on Landscape. *Landscape Research*, 16(1), 11-19.
- Vygotsky, L.S. (s/f). *Psicología del arte*. Barcelona: Barral, 1970.
- Ward and Russell (1981). The psychological representation of molar physical environments. *Journal of Experimental psychology: General*, 110, 121-152.
- White, J. and Dunn, M.C. (1974). *Recreational use of the countryside: a case study in the West Midlands*. Birmingham: Centre for Urban and Regional Studies, Research Memorandum, nº 33.
- Wohlwill, J.F. (1976). Environmental aesthetics: the environment as a source of affect. In I. Altman and J.F. Wohlwill (eds.). *Human behavior and environment*, Vol. 1 (pp. 37-85). New York: Plenum Press.
- Zajonc, R.B. (1980). Feeling and thinking. Preferences need no inferences. *American Psychologist*, 35 (2), 151-175.
- Zube, E.H. (1980). *Environmental Evaluation: Perception and Public Policy*. Cambridge/New York: Cambridge University Press, 1984.
- Zube, E.H.; Sell, J.L. and Taylor (1982). Landscape perception: research, application and theory. *Landscape Planning*, 9, 1- 33.